

Giardiasis

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Giardia lamblia is a protozoan parasite that has two forms: cyst and trophozoite. Infected persons can shed both trophozoites and cysts in stool.

B. Clinical Description

Symptoms of giardiasis are variable but typically include watery, foul-smelling diarrhea. Abdominal cramps and a “bloated” feeling with excess gas often accompany the diarrhea. The diarrhea can be chronic or intermittent and it can be accompanied by fatigue and steatorrhea (fatty stools). Anorexia combined with malabsorption can lead to significant weight loss, failure to thrive and anemia. However, many infections are asymptomatic. The nature of immunity is uncertain. Some people with regular exposure may develop some degree of resistance to illness. Treatment failure is not uncommon (~10% of the time) but is not indicative of resistance by the parasite. A repeat course of the same medication may be indicated.

C. Reservoirs

Humans and some animals (dogs, cats, rodents, cattle, deer, elk, beaver, and muskrats) are reservoirs, although the public health importance of most nonhuman reservoirs is debated. Overall, humans are the most important source of other human infections. Wildlife such as deer, elk, and beaver may be important in contaminating surface water supplies; domestic animals (*e.g.*, dogs) may be a source for some human exposures.

D. Modes of Transmission

The principal mode of transmission of giardiasis is person-to-person. Persons become infected by fecal-oral transfer of cysts from the feces of an infected individual, especially in institutions and daycare centers. Transmission can also occur person-to-person through certain types of sexual contact (*e.g.*, oral-anal contact). Localized outbreaks may occur from fecally contaminated water, such as stream/lake waters and swimming pools that are open to contamination by human and animal feces. Eating food contaminated by an infected foodhandler can be a source, but this has been rarely documented.

E. Incubation Period

The incubation period can vary from 3 to 25 days (or longer); the median is 7–10 days.

F. Period of Communicability or Infectious Period

The disease is communicable for as long as the infected person excretes the organism, which may be many months. The asymptomatic carrier rate is high.

G. Epidemiology

Giardiasis has a worldwide distribution. Children are infected more frequently than adults. Prevalence is higher in areas of poor sanitation and in institutions with children who are not toilet trained, especially daycare centers. Surveys conducted in the United States have demonstrated prevalence rates of *Giardia* in stool specimens that range from 1% to 30%, depending on location and age. Cases occur more commonly in the summer and fall months.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. What to Report to the Massachusetts Department of Public Health

Report a case that meets any of the following criteria:

- Demonstration of *Giardia lamblia* cysts in stool; or
- Demonstration of *Giardia lamblia* trophozoites in stool, duodenal fluid, or small-bowel biopsy; or
- Demonstration of *Giardia lamblia* antigen in stool by a specific immunodiagnostic test (e.g., enzyme-linked immunosorbent assay).

Note: See Section 3) C below for information on how to report a case.

B. Laboratory Testing Services Available

The Massachusetts State Laboratory Institute does not provide services for ova and parasite testing for clinical specimens or food samples.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (e.g., a diapered child, daycare attendee or foodhandler) and, if so, to prevent further transmission.
- To identify transmission sources of public health concern (e.g., a restaurant or a contaminated public water supply) and to stop transmission from such sources.

B. Laboratory and Healthcare Provider Reporting Requirements

Refer to the lists of reportable diseases (at the end of this manual's Introduction) for information.

C. Local Board of Health Reporting and Follow-Up Responsibilities

1. Reporting Requirements

Massachusetts Department of Public Health (MDPH) regulations (*105 CMR 300.000*) stipulate that each local board of health (LBOH) must report the occurrence of any case of giardiasis, as defined by the reporting criteria in Section 2) A above. Current requirements are that cases be reported to the MDPH Division of Epidemiology and Immunization, Surveillance Program using an official MDPH *Bacterial and Parasitic Gastroenteritis Case Report Form* (in Appendix A). Refer to the *Local Board of Health Reporting Timeline* (at the end of this manual's introductory section) for information on prioritization and timeliness requirements of reporting and case investigation.

2. Case Investigation

- a. It is the LBOH responsibility to complete a *Bacterial and Parasitic Gastroenteritis Case Report Form* (in Appendix A) by interviewing the case and others who may be able to provide pertinent information. Much of the information required on the form can be obtained from the case's healthcare provider or the medical record.
- b. Use the following guidelines to assist you in completing the form:
 - 1) Accurately record the demographic information, date of symptom onset, symptoms, and medical information.
 - 2) When asking about exposure history (food, travel, activities, etc.), use the incubation period range for giardiasis (3–25 days). Specifically, focus on the period beginning a minimum of 3 days prior to the case's onset date back to no more than 25 days before onset.
 - 3) If possible, record any restaurants at which the case ate, including food item(s) and date consumed. If you suspect that the case became infected through food, use of the MDPH *Foodborne Illness Complaint Worksheet* (in Appendix A) will facilitate recording additional information. It is requested that LBOHs fax or mail this worksheet to the MDPH Division of Food and Drugs (see top of worksheet for fax number and address). This information is entered into a database to help link other complaints from neighboring towns, thus helping to identify foodborne illness outbreaks. *This worksheet does not replace the Bacterial and Parasitic Gastroenteritis Case Report Form.*

- 4) Ask questions about travel history and outdoor activities to help identify where the case became infected.
 - 5) Ask questions about water supply because giardiasis may be acquired through water consumption.
 - 6) Household/close contact, pet or other animal contact, daycare, and food handler questions are designed to examine the case's risk of having acquired the illness from, or potential for transmitting it to, these contacts. Determine whether the case attends or works at a daycare facility and/or is a foodhandler.
 - 7) If you have made several attempts to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return your calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), please fill out the case report form with as much information as you have gathered. Please note on the form the reason why it could not be filled out completely.
- c. After completing the case report form, attach lab report(s) and mail (in an envelope marked "Confidential") to the MDPH Division of Epidemiology and Immunization, Surveillance Program. The mailing address is:
MDPH, Division of Epidemiology and Immunization
Surveillance Program, Room 241
305 South Street
Jamaica Plain, MA 02130
 - d. Institution of disease control measures is an integral part of case investigation. It is the LBOH responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4), Controlling Further Spread.

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (105 CMR 300.200)

Foodhandlers with giardiasis must be excluded from work. *Note:* A case of giardiasis is defined by the reporting criteria in Section 2) A of this chapter.

Minimum Period of Isolation of Patient

After diarrhea has resolved, foodhandling facility employees may only return to work after producing one negative stool specimen. If a case has been treated with an antimicrobial, the stool specimen shall not be submitted until at least 48 hours after cessation of therapy. In outbreak circumstances, a second consecutive negative stool specimen is required prior to returning to work.

Minimum Period of Quarantine of Contacts

Contacts with diarrhea who are foodhandling facility employees shall be considered the same as a case and handled in the same fashion. No restrictions otherwise.

Note: A foodhandler is any person directly preparing or handling food. This can include a patient care or child care provider. See glossary for a more complete definition.

B. Protection of Contacts of a Case

None.

C. Managing Special Situations

Daycare

Since giardiasis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of giardiasis in a daycare setting. The MDPH *Health and Safety in Child Care*

provides detailed information on case follow-up and control in a daycare setting. General recommendations include:

- Children with giardiasis who have diarrhea should be excluded until their diarrhea is gone.
- Children with giardiasis who have no diarrhea and are otherwise not ill may be excluded or remain in the program if special precautions are taken.
- Since most staff in child care programs are considered foodhandlers, those with *Giardia* in their stools (symptomatic or not) can remain on site, but must not prepare food or feed children until their diarrhea is gone and they have one negative stool test (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). (Per *105 CMR 300.200*)
- Refer to Chapter 17 of the MDPH *Health and Safety in Child Care* for complete guidelines on handling diseases spread through the intestinal tract.

School

Since giardiasis may be transmitted person-to-person through fecal-oral transmission, it is important to carefully follow up on cases of giardiasis in a school setting. The MDPH *Comprehensive School Health Manual* provides detailed information on case follow-up and control in a school setting. General recommendations include:

- Students or staff with giardiasis who have diarrhea should be excluded until their diarrhea is gone.
- Students or staff with giardiasis who do not handle food, have no diarrhea or mild diarrhea and are not otherwise sick, may remain in school if special precautions are taken.
- Students or staff who handle food and have giardiasis infection (symptomatic or not), must not prepare food until their diarrhea is gone and they have one negative stool test (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). (Per *105 CM 300.200*)
- Refer to Chapter 8 of the MDPH *Comprehensive School Health Manual* for complete guidelines on handling diseases spread through the intestinal tract.

Community Residential Programs.

Actions taken in response to a case of giardiasis in a community residential program will depend on the type of program and the level of functioning of the residents.

In long-term care facilities, residents with giardiasis should be placed on standard (including enteric) precautions until their symptoms subside *and* they test negative for *Giardia*. (Refer to the Division of Epidemiology and Immunization's *Control Guidelines for Long-Term Care Facilities* for further actions. A copy can be obtained by calling the Division at 617-983-6800.) Staff members who give direct patient care (e.g., feed patients, give mouth or denture care or give medications) are considered foodhandlers and are subject to foodhandler restrictions under *105 CMR 300.200*. See Section 4) A above. In addition, staff members with giardiasis who are not foodhandlers should not work until their diarrhea is gone.

In residential facilities for the developmentally disabled, staff and clients with giardiasis must refrain from handling or preparing food for other residents until their diarrhea has subsided and they have one negative stool test for *Giardia* (submitted at least 48 hours after completion of antibiotic therapy, if antibiotics are given). (Per *105 CMR 300.200*) In addition, staff members with giardiasis who are not foodhandlers should not work until their diarrhea is gone.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases of giardiasis in your city/town is higher than usual, or if you suspect an outbreak, investigate to determine source of infection and mode of transmission. A common vehicle (such as water, food or association with a daycare center) should be sought and applicable preventive or control measures should be instituted (*e.g.*, removing an implicated food item from the environment). Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist on-call at the Division of Epidemiology and Immunization at (617) 983-6800 or (888) 658-2850. The Division can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several town lines and therefore be difficult to identify at a local level.

Note: Refer to the MDPH *Foodborne Illness Investigation and Control Reference Manual* for comprehensive information on investigating foodborne illness complaints and outbreaks. (Copies of this manual were distributed to local boards of health in 1997–98. It can also be located on the MDPH website in PDF format at <<http://www.magnet.state.ma.us/dph/fpp/refman.htm>>.) For recent changes (fall of 2000) to the Massachusetts Food Code, contact the Division of Food and Drugs, Food Protection Program at (617) 983-6712 or through the MDPH website at <<http://www.state.ma.us/dph/fpp/>>.

D. Preventive Measures

Personal Preventive Measures/Education

To avoid exposure, recommend that individuals:

- Always wash their hands thoroughly with soap and water before eating or preparing food, after using the toilet and after changing diapers.
- In a daycare setting, dispose of feces in a sanitary manner.
- When caring for someone with diarrhea to scrub their hands with plenty of soap and water after cleaning the bathroom, helping the person use the toilet, or changing diapers, soiled clothes, or soiled sheets.
- When hiking or camping, be aware of the risks of drinking water from streams or lakes. Bringing water to a full, rolling boil is sufficient to kill *Giardia*. Several filters are also available that remove *Giardia* cysts. Additionally, some chemical disinfectants are effective against *Giardia*.
- Avoid sexual practices that may involve direct contact with feces. Latex barrier protection should be emphasized as a way to prevent the spread of *Giardia* to case's sexual partners as well as being a way to prevent the exposure to and transmission of other pathogens.

A *Giardia Public Health Fact Sheet* can be obtained from the Division of Epidemiology and Immunization or through the MDPH web site at <http://www.state.ma.us/dph/>. Click on the "Publications" link and scroll down to the Fact Sheets section. It is also available in Spanish.

International Travel

Travelers to developing countries should:

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than uncarbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water. Avoid popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel their own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.

Note: For more information regarding international travel, contact the CDC's Traveler's Health Office at (877) 394-8747 or through the internet at <<http://www.cdc.gov/travel>>.

ADDITIONAL INFORMATION

The formal Centers for Disease Control and Prevention (CDC) surveillance case definition for giardiasis is the same as the criteria outlined in Section 2) A of this chapter. (CDC case definitions are used by the state health department and CDC to maintain uniform standards for national reporting.) For reporting to the MDPH, always refer to the criteria in Section 2) A.

REFERENCES

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